What is claimed is:

1. An optical pulse generation system, comprising:

A. a first optical interferometric modulator including:

i. an optical input for receiving an input optical signal,

ii. at least one modulation input for receiving a first modulation drive signal centered about a first normalized bias voltage V1, the first modulation drive signal modulating the input optical signal about the first normalized bias voltage with a first normalized amplitude A1; and

iii. an optical output for providing a first modulated optical signal; and

B. a second optical interferometric modulator including:

i. an optical input for receiving the first modulated optical signal;

ii. at least one modulation input for receiving a second modulation drive signal centered about a second normalized bias voltage V2, the second modulation drive signal modulating the first modulated optical signal about the second normalized bias voltage with a second normalized amplitude A2; and

iii. an optical output for providing a second modulated optical signal comprising output optical pulses;

wherein said first modulation drive signal and said second modulation drive signal are periodic functions of time; and

wherein at least one of said first modulation drive signal and said second modulation drive signal comprises a superposition of a plurality of waveforms having different frequencies.

2. A system according to claim 1, wherein said superposition of waveforms comprises: i) a base waveform characterized by a base frequency ω_0, and ii) one or more odd harmonics of said base waveform, said odd harmonics being characterized by frequencies ω_n related to said base frequency ω_0 according to the formula:

$$\omega_n = (2\,n + 1) * \omega_0,$$

where n is a nonzero integer.

3. A system according to claim 1, wherein said base frequency ω_0 is from about 5 GHz to about 10 GHz.

4. A system according to claim 1,

wherein said first optical interferometric modulator is characterized by an optical output power-modulation voltage transfer function, and a parameter $V\pi_1$ that represents the voltage required to change the output power from the first modulator from a minimum value to a maximum value;

wherein said second optical interferometric modulator is characterized by an optical output power-modulation voltage transfer function, and a parameter $V\pi_2$ that represents the voltage required to change the output power from the second modulator from a minimum value to a maximum value;

wherein said first normalized bias voltage V1 and said first normalized amplitude A1 are normalized relative to $V\pi_1$; and

wherein said second normalized bias voltage V1 and said second normalized amplitude A2 are normalized relative to $V\pi_2$.

5. A system according to claim 1, wherein the relative amplitudes of said plurality of waveforms are selected so that the optical pulses in the second modulated signal have at least one of a predetermined extinction ratio and a predetermined pulse width.

6. A system according to claim 1, wherein at least one of the first and second normalized bias voltages and the first and second normalized amplitudes is selected so that the optical pulses in the second modulated signal have a predetermined extinction ratio.

7. A system according to claim 1, wherein at least one of the first and second normalized bias voltages and the first and second normalized amplitudes is selected so that the optical pulses in the second modulated signal have a predetermined pulse width.

8. A system according to claim 5, wherein said predetermined extinction ratio is between about 30 dB to about 50 dB.

9. A system according to claim 5, wherein said predetermined pulse width is between about 8 ps to about 16 ps.

10. A system according to claim 5,

wherein said predetermined pulse width is about 9.5 ps,

wherein said first and said second modulation drive signals each comprise a superposition of a first waveform having a frequency of about 5 GHz and an amplitude of about (2.6) * $V\pi_1$, and second waveform having a frequency of about 15 GHz, and

wherein the ratio between the amplitude of the second waveform and the amplitude of the first waveform is about 0.29 in both drive signals;

and

wherein said first bias voltage V1 biases the first modulator at a maximum optical transmission, and said second bias voltage V2 biases the second modulator at a maximum optical transmission.

11. A system according to claim 1, wherein the relative amplitudes of said plurality of waveforms are chosen so as to substantially reduce fluctuations in optical power due to coherent interference of the optical pulses in the second modulated optical signal, during optical time division multiplexing.

12. A system according to claim 11, wherein said fluctuations due to coherent interference are reduced to between about 0.1 dB to about 0.5 dB.

13. A system according to claim 11,

wherein said fluctuations due to coherent interference are about 0.17 dB;

wherein said first and said second modulation drive signals each comprise a superposition of a first waveform having a frequency of about 5 GHz and an amplitude of about (2.35) * $V\pi_1$, and second waveform having a frequency of about 15 GHz, the ratio between the amplitude of the second waveform and the amplitude of the first waveform being about 0.15 in both drive signals;

and

wherein said first bias voltage V1 biases the first modulator at a maximum optical

transmission, and said second bias voltage V2 biases the second modulator at a maximum optical transmission.

14. A system according to claim 1, wherein at least one of the first and second interferometric modulators comprises a Mach-Zehnder modulator.

15. A system according to claim 1, further comprising:

a. means for generating said first modulation drive signal and for applying said first modulation drive signal to said at least one modulation input of said first interferometric modulator; and

b. means for generating said second modulation drive signal and for applying said second modulation drive signal to said at least one modulation input of said second interferometric modulator.

16. A system according to claim 1, further comprising bias means for biasing said first and said second modulation drive signals.

17. An optical pulse generation system, comprising:

A. a first optical interferometric modulator having:

i. an optical input for receiving an optical input signal,

ii. a modulation input for receiving a first modulation drive signal, and

iii. an optical output for providing a first modulated optical signal;

wherein said first optical interferometric modulator is characterized by an optical output power-modulation voltage transfer function, and a parameter $V\pi_1$ that represents

the voltage required to change the output power from the first modulator from a minimum value to a maximum value;

wherein said transfer function of said first optical interferometric modulator is symmetrical about a center voltage between a lower drive voltage V_{1-} and an upper drive voltage V_{1+}, and is substantially a single period sinusoid as a function of drive voltage between V_{1-} and V_{1+}, having a maximum optical output power at the center voltage, and a minimum optical output power at V_{1-} and V_{1+};

B. a second optical interferometric modulator having:

i. an optical input for receiving the first modulated optical signal,

ii. a modulation input for receiving a second modulation drive signal, and

iii. an optical output that provides a second modulated optical signal comprising optical pulses;

wherein said second optical interferometric modulator is characterized by an optical output power-modulation voltage transfer function, and a parameter $V\pi_2$ that represents the voltage required to change the output power from the second modulator from a minimum value to a maximum value;

wherein said transfer function of said second optical interferometric modulator is symmetrical about a second center voltage between a lower drive voltage V_{2-} and an upper drive voltage V_{2+}, and is substantially a single period sinusoid as a function of drive voltage between V_{2-} and V_{2+}, having a maximum value at said second center voltage, and a minimum optical output power at V_{1-} and V_{1+};

C. a first modulator driver for applying said first modulation drive signal to said modulation input of said first modulator,

wherein said first modulation drive signal is a periodic function of time having an amplitude A1 normalized to $V\pi_1$, and is centered about a first bias voltage $V1 = V_{1-} + V_{1B}$, wherein V_{1B} is a voltage magnitude normalized to $V\pi_1$; and

D. a second modulator driver for applying said second modulation drive signal to said modulation input of said second modulator,

wherein said second modulation drive signal is a periodic function of time having an amplitude A2 normalized to $V\pi_2$, and is centered about a second bias voltage $V2 = V_{2-} + V_{2B}$, wherein V_{2B} is a voltage magnitude normalized to $V\pi_2$;

wherein at least one of the first and second modulation drive signals comprises a superposition of multi-frequency waveforms.

18. A system according to claim 17, wherein V_{1B} has a magnitude of about $V\pi_1$ so as to bias the first interferometric modulator substantially at a maximum optical transmission, and wherein V_{2B} has a magnitude of about $V\pi_2$ so as to bias the second interferometric modulator substantially at a maximum optical transmission.

19. A method of generating optical pulses, the method comprising:

A. generating a first modulated optical signal comprising optical pulses by applying a first modulation drive signal to a modulation input of a first optical interferometric modulator so as to modulate an input optical signal that has been received into an optical input of said first interferometric modulator, said first modulation drive signal being characterized by a first normalized bias voltage and a first normalized amplitude;

B. generating a second modulated optical signal comprising optical pulses by

applying a second modulation drive signal to a modulation input of a second optical interferometric modulator so as to modulate the first modulated optical signal with a second modulation drive signal characterized by a second normalized bias voltage and a second normalized amplitude;

wherein the first modulation drive signal and the second modulation drive signal are periodic functions of time, and

wherein at least one of the first modulation drive signal and the second modulation drive signal comprises a superposition of a plurality of waveforms having different frequencies.

20. A method according to claim 19, further comprising varying the relative amplitudes of said plurality of waveforms so as to substantially minimize coherent interference when the optical pulses in the second modulated optical signal are optically time-division-multiplexed.

21. A method according to claim 19, further comprising varying the relative amplitudes of said plurality of waveforms so as to substantially maximize the extinction ratio and substantially minimize the pulse width of the optical pulses in the second modulated optical signal.

22. A method according to claim 19, further comprising varying the relative amplitudes of said plurality of waveforms so as to achieve at least one of a predetermined extinction ratio and a predetermined pulse width of the optical pulses in the second

modulated optical signal.

23. A method according to claim 22, wherein said predetermined extinction ratio is from about 30 dB to about 50 dB, and wherein said predetermined pulse width is from about 8 ps to about 16 ps.

24. A method according to claim 19, further comprising varying at least one of the first normalized amplitude and the second normalized amplitude to achieve optical pulses in the second modulated optical signal having a predetermined pulse width.

25. An optical pulse generation system, comprising:

A. a first optical interferometric modulator including:

i. an optical input for receiving an input optical signal,

ii. at least one modulation input for receiving a first modulation drive signal centered about a first normalized bias voltage V1, the first modulation drive signal modulating the input optical signal about the first normalized bias voltage with a first normalized amplitude A1; and

iii. an optical output for providing a first modulated optical signal; and

B. a second optical interferometric modulator including:

i. an optical input for receiving the first modulated optical signal;

ii. at least one modulation input for receiving a second modulation drive signal centered about a second normalized bias voltage V2, the second modulation drive signal modulating the first modulated

optical signal about the second normalized bias voltage with a second normalized amplitude A2; and

iii. an optical output for providing a second modulated optical signal comprising output optical pulses;

wherein said first modulation drive signal and said second modulation drive signal are periodic functions of time characterized by a substantially identical frequency; and

wherein the ratio of the first normalized amplitude and the second normalized amplitude is adjusted so as to achieve a predetermined pulse width for the optical pulses in the second modulated signal.

26. A system according to claim 25, wherein the first normalized voltage is substantially equal to the second normalized voltage.